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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/286,418 04/06/99 KIFUKU

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PM82/0117

SUGHRUE MION ZINN MACPEAK & SEAS
2100 PENNSYLVANIA N W
WASHINGTON DC 20037

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EXAMINER

BROADHEAD, B

ART UNIT	PAPER NUMBER
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3661

DATE MAILED: 01/17/01

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/286,418

Applicant(s)

KIFUKU, TAKAYUKI

Examiner

Brian J. Broadhead

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☒ The proposed drawing correction filed on 02 November 2000 is: a) ☒ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

DETAILED ACTION

Drawings

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 11-2-00 have been accepted.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 1 through 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Kifuku et al., 5740040.

As per claim 1, Kifuku et al. discloses means of computing an estimated value of static friction of the steering system and means of compensating for the static friction based on this estimated value of static friction on lines 34-39, on column 20.

As per claim 2, Kifuku et al. discloses the static friction of the steering system is estimated by extracting the edge of the steering force detection value on lines 45-46, on column 20.

As per claim 3, Kifuku et al. discloses the static friction of the steering system is estimated by extracting the edge of motor angular velocity, motor back electromotive force, or steering angular velocity on lines 45-46, on column 20.

As per claim 4, Kifuku et al. discloses the static friction of the steering system is estimated by extracting the edge of a motor current on lines 25-28, on column 21.

As per claim 5, Kifuku et al discloses the static friction of the steering system is estimated by extracting a edge of the steering force detection value, the motor angular velocity, the motor back electromotive forces, the steering angular velocity, or the motor current wherein the extraction of the edge is carried out through a high frequency pass filter on lines 5-12, on column 6.

As per claim 6, Kifuku et al. discloses the time constant of the high-frequency pass filter is made almost equal to the mechanical time constant or acceleration constant of the motor on lines 55-62, on column 13.

As per claim 7, Kifuku et al. discloses the static friction of the steering system is estimated by extracting an edge of the steering force detection value, the motor angular velocity, the motor back electromotive force, the steering angular velocity, or the motor current, and the static friction of the steering system is estimated by multiplying an extracted value of the edge by a predetermined function of the motor angular velocity, motor back electromotive force or steering angular velocity on lines 33-39, on column 20.

As per claim 8, Kifuku et al. discloses there is an upper limit for the static friction estimated value on lines 1-5, on column 21.

As per claim 9, Kifuku et al. discloses the static friction compensation having a term proportional to the static friction estimated value obtained by the positive feedback of the static friction estimated value is computes and the static friction of the steering

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system is compensated by the static friction compensation on lines 47-52, on column 20.

As per claim 10, Kifuku et al. discloses the gain of the positive feedback is set such that the static friction estimated value and the motor output torque become almost equal to each other on lines 47-52, column 20. Compensating for a friction is producing a force to counteract the frictional force. They would be equal but opposite in direction.

As per claim 11, Kifuku et al. discloses the static friction compensation obtained through the means of compensating for the static friction is obtained from both a term proportional to the static friction estimated value and a term for compensating for the nonlinearity of the motor or a motor reduction gear on lines 47-52, on column 20, and in figure 33.

As per claim 12, 13, 14, 15, 16, and 17, Kifuku et al. discloses the term for compensating for the nonlinearity of the motor or the motor reduction gear and an upper limit is used when the static friction estimated value is larger than a predetermined value and they are changed based on car speed or engine speed in figure 33.

As per claim 18, Kifuku et al. discloses the dynamic friction or inertia of the steering system is compensated based on the angular velocity or angular acceleration of the motor or steering in figure 31, item 13.

As per claim 19 and 20, Kifuku et al. discloses a term for compensating for dynamic friction, a term for compensating for static friction, and a term for the nonlinearity of the motor are weighed so that at least one of them is used in figure 31.

Response to Amendment

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4. Applicant's arguments with respect to claims 1 through 20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

6. Shimizu et al., 6102151, discloses an electric power steering apparatus.

7. Wada et al., 5467279, discloses a motor-assisted power steering control device.

8. Wada et al., 5631833, discloses a motor-assisted power steering control device.

9. Nakamura et al., 5992557, discloses an electric power steering apparatus.

10. Shimizu et al., 5482129, discloses an electrically operated power steering apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Broadhead whose telephone number is 703-308-9033. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William A. Cuchlinski can be reached on 703-308-3873. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-7687 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

BJB
January 12, 2001

Jacques Louis-Jacques
JACQUES H. LOUIS-JACQUES
PRIOR ART EXAMINER